

# EPA Comments on the April 2015 Draft Soil Study Data Summary and Data Gap Report - Upper Columbia River Site RI/FS (07/09/15)

## General Comments

1. The draft DSR contains text regarding the "sufficiency" of the sampling and lack of data gaps that EPA does not necessarily agree with. It is not clear that there are no data gaps remaining after the 2013 soil sampling. The low percentage of sampling completeness for the relict flood plain deposition areas (RFDA) and Windblown Sediment Deposition Areas (WSDAs) may represent data gaps. Additional sampling may also be necessary to fully define aerial deposition areas (ADAs) where metal concentrations (e.g., lead and arsenic) exceed screening levels or to complement the few DUs sampled in UDUs along the eastern side of the UCR nearest the border. Analyses of residential and upland soil study results will determine if there are remaining data gaps for the human health risk assessment (HHRA) or Baseline Ecological Risk Assessment (BERA). Remove statements indicating that samples are sufficient for risk characterization or that there are no data gaps (e.g., "...samples....are considered sufficient..." TAI can remove "and Data Gap" from the title so that this document is strictly a Soil Study Data Summary Report.
2. Reference 2012a, "*EPA Technical Team level of effort (LOE) for sampling and analysis of soil in the Upper Columbia River Basin (soil LOE)*. U.S. Environmental Protection Agency Technical Team" is cited multiple times as stating that windblown sediment depositional areas (WSDAs) need not be sampled for human health assessments because previous sampling of 42 beaches indicated no human health risks. The soil LOE did not state this. The soil LOE indicated that WSDAs did not require sampling for human health risk assessment, but no specific reason for this was given. One potential reason for the lack of human health sampling is that the beaches sampled at or very close to the WSDAs (Summer Island and Marcus Island for the Marcus Flats WSDAs and Seven Bays for the Columbia Beach WSDAs) had no lead or arsenic concentrations above screening levels. The EPA beach study fact sheet<sup>1</sup> publicly issued in April 2012 states that "*All but three of the beaches sampled are safe for recreational use.*" An appropriate reference for beach sediment human health risk assessment needs to be provided or reference to the EPA beach study fact sheet shall be made with text stating that "*WSDAs were focused on evaluating risks to ecological receptors. Prior sampling showed that the beaches sampled nearest the WSDAs (Summer Island and Marcus Island for the Marcus Flats WSDAs and Seven Bays for the Columbia Beach WSDAs) had no lead or arsenic concentrations above human health screening levels.*"
3. The Draft Upland Soil Data Summary Report refers to constituents as "COIs" whereas the QAPP refers to them as "COPCs". COPCs are appropriate in this documents since an initial screening of COIs was done in the SLERA (see Tables 6-4 and 7-1) and we are now considering COPCs. Replace "COI" with "COPC" throughout the document.

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<sup>1</sup> [http://www.epa.gov/region10/pdf/sites/ucr/UCR\\_beach\\_screeningFS\\_4\\_12.pdf](http://www.epa.gov/region10/pdf/sites/ucr/UCR_beach_screeningFS_4_12.pdf)

**Specific Comments**

ID	Section	Page	Comment
1.	2.2.2	2-2	<p>Reiterate the risk questions presented on page A-10 (Step 2, section A.7.2) of the QAPP along with DQOs in Step 2.</p> <p><i>"- Are reproduction, growth, or survival of terrestrial invertebrates or plants adversely affected by COPCs in UCR soil?</i>  <i>- Are COPCs in UCR soils at concentrations that will adversely affect survival, growth or reproduction, of adult life stages of amphibians or reptiles (herpetofauna)?</i>  <i>- Are COPCs in UCR soils at concentrations that will adversely affect reproduction, growth, or survival of terrestrial birds or mammals?</i>  <i>- Are the health of people working, recreating, or living on the Site adversely affected by COPCs in UCR soils?"</i></p>
2.	2.2.3	2-5, footnote #5	<p><i>" WSDAs were not analyzed for human health assessments because prior sampling of 42 UCR beaches indicated no human health risks from exposed sediments"</i></p> <p>Per GC-2. Reference the EPA beach study fact sheet and revise the footnote to state that <i>"WSDAs were focused on evaluating risks to ecological receptors. Prior sampling showed that the beaches sampled nearest the WSDAs (Summer Island and Marcus Island for the Marcus Flats WSDAs and Seven Bays for the Columbia Beach WSDAs) had no lead or arsenic concentrations above human health screening levels."</i></p>
3.	2.2.4	2-3, 1 <sup>st</sup> paragraph	The first paragraph of section 2.2.4 'Define the Boundaries of the Study' includes information on soil screening levels and detection limits. Move the first paragraph in section 2.2.4 to Section 2.2.5 'Develop the Analytical Approach' to be consistent with the QAPP.
4.	2.2.4	2-4	Revise the sentence as follows <i>"...identified as WSDAs because they represent locations where the windblown re-deposition of sediment is most likely to occur and represent <del>thea</del> possible worst-case scenario."</i>
5.	2.2.5	2-5	Revise the following sentences as follows <i>"In the risk assessments, the site-specific bioavailability of metals to ecological receptors in the &lt; 2-mm fraction will be determined using the relationships among pH, CEC, and TOC, which affect the ability of organisms to take up metals from soils (e.g., Smolders et al. 2009; Checkai et al. 2014). Site-specific adjustments <del>may can</del>..."</i>
6.	2.2.5	2-6, 1 <sup>st</sup> paragraph	Revise the sentence as follows <i>"IVBA results for lead in the &lt; 149 um fraction have been used to calculate <u>site-specific</u> oral RBA values..."</i>
7.	2.2.5	2-6, 1 <sup>st</sup> paragraph	Revise the sentence as follows <i>"The spatial evaluation of data from the &lt;2-mm fraction will be conducted as part of the BERA <u>and after the</u> data <del>have been</del> <u>may be</u> adjusted for bioavailability."</i>
8.	2.2.6	2-8	Revise the sentence as follows <i>"Field split samples were pre-selected for certain DUs to assess the homogeneity of samples collected in the field. ALS Environmental (ALS) performed sample homogenization and took two aliquots of sample from the homogenized soil to generate the field split samples."</i>
9.	2.3.3	2-11	<i>"The WSDAs were not evaluated for human health because previous sampling efforts at UCR beaches indicated that there are no human health risks from exposed sediment (USEPA 2012a)."</i>

			Per GC-2. Reference the EPA beach study fact sheet and revise the text as follows: <i>"...because WSDA sampling was focused on evaluating risks to ecological receptors. Prior sampling showed that the beaches sampled nearest the WSDAs (Summer Island and Marcus Island for the Marcus Flats WSDAs and Seven Bays for the Columbia Beach WSDAs) had no lead or arsenic concentrations above human health screening levels."</i>
10.	2.3.3.1	2-11	State the width of buffer zones for roads, railways and mine sites considered in the QAPP and the total area that was not considered appropriate for potential sampling due to these exclusions.
11.	3.1	3-1	Mention that an archeologist and cultural monitor provided oversight for the protection of cultural artifacts.
12.	3.1.1	3-1, 1 <sup>st</sup> paragraph	For sample increments collected more than 10 m from the predetermined location, indicate where the final sample locations are provided in the DSR.
13.	3.1.2.1	3-2	Delete <i>"and human remains."</i> This does not need to be called out separately.
14.	3.1.3	3-4	State the number of deviations for increments that were collected more than 2 m from the predetermined increment location due to physical or access restrictions (bullet 3) and for discrepancies between the proposed and actual sample coordinates (bullet 4).
15.	3.2	3-5	<p><i>"Upon receipt at ALS, all incremental composite samples were stored at room temperature, and an aliquot was taken from each sample for the analysis of grain size distribution, total solids, and pH. The remaining sample was air dried, homogenized, and apportioned for sieving into two fractions..."</i></p> <p>Room temperature sample storage is not consistent with the QAPP which 1) describes in the text (Section B-3) and Table B3-1 that samples will be preserved at 4±2°C, and 2) that composites will be dried and homogenized prior to subsampling for grain size. The DSR text also seems to state that aliquots for grain size, pH, and total solids were obtained prior to homogenization of the samples when the QAPP (Section B-1) states that subsamples will be collected after homogenization. Describe these inconsistencies as deviations and discuss how they would affect the data if subsamples are not representative of the collected soil.</p>
16.	3.2	3-5	<p><i>"No &lt; 149-µm fraction was prepared for samples collected from the WSDAs because, as noted by EPA (USEPA 2012a), prior sampling of 42 UCR beaches indicated no human health risks from exposed sediments."</i></p> <p>Per GC-2. Reference the EPA beach study fact sheet and revise the sentence to state that <i>"...because WSDA sampling was focused on evaluating risks to ecological receptors. Prior sampling showed that the beaches sampled nearest the WSDAs (Summer Island and Marcus Island for the Marcus Flats WSDAs and Seven Bays for the Columbia Beach WSDAs) had no lead or arsenic concentrations above human health screening levels."</i></p>
17.	4.1	4-1, 1 <sup>st</sup> sentence	Add a space between "metals" and "and."

18.	4.1	4-2	<p>Clarify the definition of “U*” to be consistent with previous Data Summary Reports. For example, the Surface Water DSR (TAI 2013) states the following:</p> <p><i>"It should be noted that the laboratory (i.e., Columbia Analytical Services) does not include "B" qualifiers for metals (although they do for all other inorganics); the data validator (ESI) looks at the method blanks and adds U* qualifiers for metals (including aluminum). It should also be noted that not all of the samples with a "B" (method blank contamination) will be U* qualified. As stated in the draft DMP (TAI 2010b): "During data validation, the "B" qualified results will be evaluated and the qualifier will be modified based on the level detected in the blank as compared to the associated sample results."</i></p> <p><i>According to EPA guidance, 1) if a method blank is less than the reporting limit (RL), no qualifications of the data are required; 2) if the method blank is equal to or greater than the RL, a qualifier is applied only if the sample concentration is less than 10× the method blank concentration.</i></p> <p><i>When a sample is U* qualified, the concentration in the method blank becomes the de facto RL. The significance of this depends upon the level of the blank contamination. Low levels, even above the RL, will not be significant if they are still below benchmark values that will be used in the risk analysis (see Sections 5.4 and 7 of the report for further discussion of this concept)."</i></p>
19.	4.2	4-2	Clarify if qualifiers for CEC that were determined to be unnecessary have been removed or if they persist in the database.
20.	4.3.4	4-3	Specify the MS/MSD recoveries and RPDs, indicate how much they exceeded the control limits, and/or indicate where these data are presented in the report.
21.	4.3.3	4-3	<p><i>"Results for antimony, barium, cadmium, calcium, chromium, lead, manganese, potassium, and/or zinc in 486 samples were qualified as estimated ("J" flagged) due to MS/MSD recoveries or RPDs that were not within control limits."</i></p> <p>Clarify this data description by indicating if there were 486 samples or if the text is referring to 486 results. Also specify the MS/MSD recoveries and RPDs and indicate if/how much they exceeded the control limits, and/or indicate where these data are presented.</p>
22.	4.3.4	4-3	<p><i>"Results for aluminum, antimony, molybdenum, and/or thallium in 122 samples were qualified as estimated ("J" flagged) due to LCS recoveries that were not within control limits."</i></p> <p>Clarify this data description by indicating if there were 122 samples or if the text is referring to 122 results.</p>
23.	4.3.5	4-3	<p><i>"Results for aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, potassium, sodium, and/or vanadium in 134 samples were qualified as estimated ("J" flagged) due to laboratory duplicate or field split RPDs, or triplicate RSDs that were not within control limits."</i></p> <p>Clarify this data description by indicating if there were 134 samples or if the text is referring to 134 results.</p>

24.	4.3.6	4-3	<p><i>"Results for magnesium, potassium, and/or sodium in 88 samples were qualified as estimated ("J" flagged) due to inductively coupled plasma (ICP) interference."</i></p> <p>Clarify this data description by indicating if there were 88 samples or if the text is referring to 88 results.</p>
25.	4.3.7	4-3	<p><i>"Results for antimony, beryllium, cadmium, magnesium, molybdenum, sodium, silver and/or thallium in 238 samples were qualified as estimated ("J" flagged) due to high serial dilution percent difference."</i></p> <p>Clarify this data description by indicating if there were 238 samples or if the text is referring to 238 results.</p>
26.	4.5.3	4-3	<p><i>"Results for antimony, iron, manganese, and/or molybdenum in 33 samples were qualified as estimated ("J" flagged) due to MS/MSD recoveries that were not within control limits."</i></p> <p>Clarify this data description by indicating if there were 33 samples or if the text is referring to 33 results.</p>
27.	4.4.1	4-4	<p><i>"Results for CEC and/or TOC in 40 samples were qualified as estimated ("J" flagged) due to laboratory duplicate or field split RPDs, or triplicate RSDs that were not within control limits."</i></p> <p>Clarify this data description by indicating if there were 40 samples or if the text is referring to 40 results. It would aid the reader if the number as well as the percentage of "J" flagged results were given for CEC and TOC as well as the total.</p>
28.	4.5.2	4-4	<p><i>"Results for molybdenum or sodium in 19 samples were qualified as nondetected ("U*" flagged) due to the presence of the analyte in an associated laboratory blank."</i></p> <p>Clarify this data description by indicating if there were 19 samples or if the text is referring to 19 results.</p>
29.	4.5.3	4-5	<p><i>"The nondetected results for molybdenum or selenium in five samples were qualified "UJ" due to low MS recoveries."</i></p> <p>Clarify this data description by indicating if there were 5 samples or if the text is referring to 5 results.</p>
30.	5	5-1	Reference Exponent (2010) as the <i>draft</i> data management plan.
31.	5.1	5-2	<p><i>"The sampling completion rate for the ADA was 100 percent (Appendix A)."</i></p> <p>Explain that 142 DUs were sampled, as planned, but that all 26 reserve DUs needed to be sampled when primary DU locations could not be sampled, and one DU was not completely sampled; only half of the 30 intended increments were collected for ADA-101.</p>
32.	5.6.1	5-5	Add maps showing the results of metals that exceeded EcoSSLs (i.e., As, Ba, Cd, Cr, Co, Cu, Pb, Ni, Sb, Se, V, Zn).
33.	5.4.1	5-4	The text states that for grain size in the bulk fraction of ADA samples, the RSDs [for triplicates] were greater than the 35 percent control limit for 82 of 442 data points, whereas Table 5.7a reports RSDs exceeded 35 percent for 38 of 208 (18%) analyses (13 grain sizes in 16 samples). Clarify how the reported results in this section are consistent with those in Tables 5-7a, 5-7b, and 5-7c. It might be helpful to more clearly distinguish between exceedances of the RPD limit for splits (described as 20 percent in the QAPP and Tables) and

			the RSD limit for triplicates (described as 30 percent in the Tables but not defined in the QAPP).
34.	6	6.1	Integrate the information about sample collection into Section 7 and exclude any statements concluding that data are sufficient.
35.	6.1	6-1	Revise the sentence as follows: "Overall, the collected and analyzed samples for the ADA met targets in the QAPP <del>and are considered sufficient.</del> "
36.	6.1	6-1	Delete " <i>However, because historical flooding was likely to be widespread, rather than localized, samples that were obtained from the RFDA's should be sufficient to reasonably characterize the extent of soil contamination in the relict floodplains defined in the QAPP, even though not all targeted locations could be sampled due to access issues.</i> "
37.	6.1	6-2	Delete " <i>Thus, the collected and analyzed samples are sufficient...</i> "
38.	6.2	6-2	Delete " <i>The data are considered sufficient, and no data gaps were identified ...</i> "
39.	7	7-1	When describing the sampling procedure (third paragraph) indicate that ancillary measurements to inform contaminant bioavailability (e.g., grain size and pH) were measured in the whole soil sample prior to sieving.
40.	7	7-2	Delete " <i>Overall, no significant data gaps that would require additional upland soil sampling...</i> " through rest of the paragraph. <i>There are exceedances of human health and ecological screening levels on the edges of the sampling. EPA has not yet determined if or where additional soil sampling may be needed. See GC-1.</i>
41.	Figures 5-4a through 5-5x		Indicate the EcoSSL or Human Health Screening Level value in the legend.
42.	Figure 5-1c		Provide the working definition of total fines for this graphic.
43.	Map 5-1 and 5-2		Similar to Maps 5-1 and 5-2, construct maps for Sb, Cd, Cu, Zn for ADA and RFDA DUs.
44.	Map 5-2		Remove the >1000 ppm since none of the DUs fall into this category.
45.	Map 5-3		Remove the >20 ppm since none of the DUs fall into this category.
46.	Map 5-4		Remove the >1000 ppm since none of the DUs fall into this category.
47.	Map 5-3 and 5-4		Explain the RM730 label near RFD. If this is a river mile marker then why is it the only one and why isn't it on the river?
48.	Table 2-2		Add a row under ADA for the number of reserve locations instead of a footnote.
49.	Table 3-1		Add a row under ADA for the number of reserve locations instead of a footnote.
50.	Table 3-1 and 3-2		Include rows for RFE and Marcus Flat West to show that there were 0 of the targeted samples collected at these locations.
51.	Table 3-2		Add a row under ADA for number of reserve locations instead of a footnote.
52.	Table 3-4		Revise Footnote B as follows: " <i>No &lt;149-<math>\mu</math>m fraction was prepared for samples collected from the wind-blown sediment deposition areas (WSDAs) because, as noted by EPA (2012), prior sampling of 42 UCR beaches indicated no human health risks from exposed sediments.</i> "

53.	5.2.2 and Table 5-6	5-3	Clarify how bioavailability was calculated. On page 5-3, state that in Table 5-6, the DUs that had IVBA measured directly used the RBA specifically calculated for that DU. For DUs that did not have IVBA measured directly, the ADA overall RBA was applied. Also add a footnote in Table 5-6 to describe this.
54.	Table 5-5		Provide the individual replicate IVBA analyses in addition to the mean results for ADA-016 and RFA-001.
55.	Tables 5-7, 5-8, 5-9		Add footnotes to tables 5-7, 5-8, and 5-9 indicating that the RPD quality objective for metals, mercury, TOC, CEC, and pH is 20% (per Table B4-2 of the QAPP) and no RSD quality objective was stated for grain size in the QAPP.
56.	Table 5-11b, 5-12b and 5-12c		Values range from one to four significant figures. Be consistent.
57.	Appendix A, Section 1.3	3	This field report states that there were 23 soil split samples for EPA while the main report (Table 3-1) and section 3.1 of Appendix A both states there were 32 EPA splits. Reconcile these results.